AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application.

As shown below, please cancel claims 2-39 without prejudice, and add new claims 40-86.

Listing of Claims:

1. Method for shaping at least one workpiece, wherein

a) The workpiece (10) is placed in a shaping position on a first (12) of at least two tools (12, 13) of a shaping machine,

b) The tools (12, 13) of the shaping machine are moved toward one another,

c) The workpiece is shaped between the tools, and

d) The two tools are subsequently moved away from one another,

e) A triggering time is detected when the relative position (x) of the tools (12, 13) is in or has reached a predetermined or predeterminable reference position (xR), preferably during the relative motion of the tools toward one another,

f) At least one handling device (2) begins to lift the workpiece (10) from the first tool (12) at a lifting time,

g) The lifting time being selected or determined as a function of the triggering time.

2. (Cancelled) Method according to Claim 1, wherein the lifting time for at least one handling device is selected or determined so that the lifting time does not occur before a shaping time, when the shaping of the workpiece between the tools is concluded, or before a reversing time, when the direction of the relative motion of the tools with respect to one another reverses.

3. (Cancelled) Method according to Claim 1 or Claim 2, wherein the lifting time for at least one handling device is selected or determined so that the lifting time occurs at a predetermined or predeterminable time difference after the shaping time or after the reversing time.

4. (Cancelled) Method according to Claim 3, wherein the time difference between the lifting time and the shaping time or reversing time is generally between 0 ms and 300 ms maximum, and/or a maximum of three-fourths of the time for the tools to move apart, in particular between 0 ms and 100 ms maximum, and/or a maximum of one-fourth of the time for the tools to move apart, and preferably between 0 ms and 50 ms maximum, and/or a maximum of one-eighth of the time for the tools to move apart, and/or is selected as a function of a predetermined tool contact time.

5. (Cancelled) Method according to one or more of the preceding claims, wherein the first tool is essentially stationary with respect to an external reference system, such as a frame of the shaping machine or the floor, and the relative motion and relative position are the motion and position, respectively, of the second tool relative to the external reference system.

6. (Cancelled) Method according to one or more of the preceding claims, wherein at least one handling device places the workpiece in its shaping position on the first tool.

7. (Cancelled) Method according to one or more of the preceding claims, wherein at least one handling device securely holds the workpiece in its shaping position between the tools during shaping.

8. (Cancelled) Method according to one or more of the preceding claims, wherein the tool is shaped in at least two shaping steps between the same tools, the workpiece being lifted from the first tool by at least one handling device after one shaping step and is then repositioned on the first tool in the shaping position for the subsequent shaping step, in particular for ventilating by a blower.

9. (Cancelled) Method according to one or more of the preceding claims, wherein the workpiece is shaped in at least two shaping steps between different tools or tool regions, the workpiece being lifted from the first tool by at least one handling device after one shaping step and is then positioned on the first tool in another tool region or placed in another tool in the shaping position for the subsequent shaping step.

10. (Cancelled) Method according to one or more of the preceding claims, wherein after the shaping step or after the last shaping step each workpiece, after being lifted from the tool or tool region, is conveyed by at least one handling device to a depositing device and deposited there.

11. (Cancelled) Method according to one or more of the preceding claims, wherein at least one control device is provided which controls the motions of at least one handling device, and which determines the lifting time as a function of the triggering time and initiates a lifting motion of the handling device at the determined lifting time.

12. (Cancelled) Method according to Claim 11, wherein at least one position detection device is provided which sends a trigger signal to the control device at the triggering time, when the relative position of the tools reaches the reference position, and wherein the control device determines the lifting time as a function of the input time of the trigger signal.

13. (Cancelled) Method according to Claim 12, wherein the position detection device comprises a position switch which is associated with or located at a reference position, and which changes its switching state when actuated by one of the two tools, a change in switching state of the position switch being used as a trigger signal or triggering time.

14. (Cancelled) Method according to Claim 11, wherein at least one position detection device is provided which measures the relative position of the two tools with respect to one another continuously and/or at specified measuring points, and sends a corresponding position measurement signal or corresponding position measurement value to the control device, and wherein the control device then compares the position measurement signal or the position measurement value to a reference signal or reference value corresponding to the reference position, and uses the agreement of the position measurement signal with the reference signal, or of the position measurement value with the reference value, as a triggering time and determines the lifting time therefrom.

15. (Cancelled) Method according to one or more of the preceding claims, wherein the relative speed and/or relative acceleration of the two tools is determined at at least one relative position of the tools, preferably the reference position, and the lifting time is determined

from the triggering time as a function of the determined relative speed and/or relative acceleration of the two tools.

16. (Cancelled) Method according to one or more of the preceding claims, wherein the lifting time is determined from the triggering time by counting or allowing to elapse a predetermined delay time with respect to the triggering time.

17. (Cancelled) Method according to Claim 11 or to one or more of the claims relating back to Claim 11, wherein at a starting time the control device sends a start signal to at least one handling device, and after receiving after receiving this start signal at least one handling device begins a lifting motion and lifts the workpiece at the lifting time.

18. (Cancelled) Method according to Claim 17 relating back to Claim 16, wherein the control device determines the starting time for the start signal by allowing to elapse or counting a predetermined delay time with respect to the triggering time, and the lifting time results from the starting time in a well-defined manner, generally by addition of the signal propagation time and signal processing time of the start signal for the handling device.

19. (Cancelled) Method according to Claim 16 or to one of the claims relating back to Claim 16, wherein the delay time is or becomes predetermined as a function of the progression of at least one relative motion variable in the relative motion of the tools with respect to one another, and/or as a function of an adjusted or adjustable shaping energy.

20. (Cancelled) Method according to one or more of the preceding claims, wherein the reference position for the tools is or becomes specified by the progression over time of the relative motion of both tools.

21. (Cancelled) Method according to one or more of the preceding claims, wherein the reference position for the tools is or becomes specified by the shaping energy for shaping the tool, or a variable uniquely correlated with the shaping energy.

22. (Cancelled) Method according to one or more of the preceding claims, wherein the shaping energy for shaping the workpiece or a variable uniquely correlated with the shaping energy

is adjustable to one of at least two different values, and the reference position for the tools is set as a function of the adjusted value of the shaping energy or of the correlated variable.

23. (Cancelled) Method according to one or more of the preceding claims, wherein the reference position for the tools is or becomes specified so that the sum of the minimum signal or data propagation times and the signal or data processing times necessary for determining the lifting time from the triggering time is less than the time interval between the lifting time and the triggering time.

24. (Cancelled) Method according to one or more of the preceding claims, wherein the reference position corresponds to the relative position of the tools at their farthest distance apart from one another.

25. (Cancelled) Method according to one or more of the preceding claims, wherein the reference position is between the relative position of the tools at their farthest distance apart from one another and the closest relative position of the tools.

26. (Cancelled) Method according to one or more of the preceding claims, wherein the workpiece is handled at least during lifting by at least two handling devices, the motions and positions of the handling devices being automatically controlled or regulated by mutual coordination.

27. (Cancelled) Method according to one or more of the preceding claims, wherein the lifting time is learned or adaptively determined by determining the relative position of the tools at the lifting time and adjusting the lifting time to a desired value, in particular by adapting the delay time to the triggering time, or by adjusting the reference position.

28. (Cancelled) Method according to one or more of the preceding claims, wherein scale material is blown out under the lifted tool and/or from the first tool by use of at least one blower.

29. (Cancelled) Method according to Claim 28, wherein a switch-on time for the blower is determined as a function of the triggering time, and preferably occurs after the lifting time.

30. (Cancelled) Method according to one or more of the preceding claims, wherein a forging hammer, screw press, or crank press is or becomes provided as the shaping machine.

31. (Cancelled) Device for shaping at least one workpiece, in particular for use in a method according to one of Claims 1 through 30 or for carrying out a method according to one of Claims 1 through 30, comprising

a) at least one shaping machine having at least two tools that are movable toward and away from one another for shaping a workpiece which is placed on a first of the tools in a predetermined or predeterminable shaping position between the tools,

b) at least one position detection device for detecting a triggering time when the relative motion (x) of the tools (12, 13) is in or has reached a predetermined or predeterminable reference position (xR), preferably during the relative motion of the tools toward one another,

c) at least one handling device for handling the workpiece,

d) at least one control device for controlling or regulating the motions and positions of the handling device(s), and

e) the control device determining a lifting time as a function of the triggering time and actuating at least one handling device (2) in such a way that at least one handling device begins to lift the workpiece (10) from the first (12) of the tools at the lifting time.

32. (Cancelled) Device according to Claim 31, wherein each handling device comprises

a) at least one gripping mechanism having at least two gripping elements that are movable relative to one another for gripping the workpiece,

b) at least one support apparatus to which the gripping mechanism is or may be fastened, and

c) at least one conveying device for conveying the support apparatus along with the gripping mechanism.

33. (Cancelled) Device according to Claim 32, wherein the support apparatus and the conveying device in a flexible state are connected to one another in a flexible manner, and in a rigid state are essentially connected to one another in a rigid manner or are positioned relative to one another in a rigid manner, at least in one three-dimensional direction and/or in each rotational position of the gripping mechanism and/or of the gripping element(s).

34. (Cancelled) Device according to Claim 33, wherein the support apparatus and the conveying device are connected to one another by at least one connecting element, which in the flexible state is flexible and in the rigid state is rigid.

35. (Cancelled) Device according to Claim 33 or Claim 34, wherein the support apparatus and the conveying device are connected to one another by at least one flexible element and in the flexible state are connected only via the flexible element, and in the rigid state are essentially supported on or against one another by at least one support device which bridges the flexible element.

36. (Cancelled) Device according to one or more of Claims 31 through 35, wherein the tools of the shaping machine are shaping forging die tools for combined shaping of the workpiece.

37. (Cancelled) Device according to one or more of Claims 31 through 36, wherein a forging hammer, screw press, or crank press is provided as the shaping machine.

38. (Cancelled) Device according to one or more of Claims 31 through 37, having at least one blower for blowing out scale material under the lifted tool and/or from the first tool.

39. (Cancelled) Device according to Claim 38, wherein each blower is switched on by the control device at a switch-on time, and the control device determines the switch-on time as a function of the triggering time, which preferably occurs after the lifting time.

40. (New) A method for shaping at least one workpiece, comprising:

placing a workpiece in a shaping position on a first of at least two tools of a shaping machine;

moving tools of the shaping machine toward one another;

shaping the workpiece between the tools;

moving the tools subsequently away from one another;

detecting a triggering time when the relative position of the tools is in or has reached a predetermined reference position, preferably during the relative motion of the tools toward one another;

lifting the workpiece from a first tool of the at least two tools utilizing at least one handling device beginning at a lifting time; and

selecting the lifting time as a function of the triggering time.

41. (New) A method according to claim 40, wherein determining the lifting time for at least one handling device is conducted so that the lifting time does not occur before a shaping time, when the shaping of the workpiece between the tools is concluded, or before a reversing time, when the direction of the relative motion of the tools with respect to one another reverses.

42. (New) A method according to claim 41, wherein selecting or determining the lifting time for at least one handling device is conducted so that the lifting time occurs a predetermined time difference after at least one of the shaping time and the reversing time.

43. (New) A method according to claim 42, wherein the time difference between the lifting time and the shaping time is selected from at least one of between 0 ms and 300 ms and equal to or less than three-fourths of the time for the tools to move apart.

44. (New) A method according to claim 43, wherein the time difference between the lifting time and the shaping time is selected from at least one of between 0 ms and 100 ms and equal to or less than one-fourth of the time for the tools to move apart.

45. (New) A method according to claim 43, wherein the time difference between the lifting time and the shaping time is selected from at least one of between 0 ms and 50 ms maximum and equal to or less than one-eighth of the time for the tools to move apart.

46. (New) A method according to claim 43, wherein the time difference between the lifting time and the shaping time is selected as a function of a predetermined tool contact time.

47. (New) A method according to claim 40, wherein the first tool is effectively stationary with respect to an external reference point, such as a frame of the shaping machine or the floor.

48. (New) A method according to claim 40, wherein at least one handling device places the workpiece in its shaping position on the first tool.

49. (New) A method according to claim 48, wherein at least one handling device securely holds the workpiece in its shaping position between the tools during shaping.

50. (New) A method according to claim 49, wherein the workpiece is shaped in at least two shaping steps, each shaping step utilizing the same tools to shape the workpiece.

51. (New) A method according to claim 50, wherein the during shaping of the workpiece, the workpiece is lifted from the first tool by at least one handling device after an initial amount of shaping and is then repositioned on the first tool in the shaping position as part of subsequent shaping and to allow for ventilation by a blower.

52. (New) A method according to claim 49, wherein the workpiece is shaped in at least two shaping steps between different tools or tool regions, the workpiece being lifted from the first tool by at least one handling device after one shaping step and is then positioned on the first tool in another tool region or placed in another tool in the shaping position for the subsequent shaping step.

53. (New) A method according to claim 52, wherein after the shaping step or subsequent shaping step and after being lifted from the tool or tool region, each workpiece is conveyed by at least one handling device to a depositing device and is deposited at the depositing device.

54. (New) A method according to claim 52, wherein at least one control device is provided which controls the motions of at least one handling device, which determines the lifting time as a function of the triggering time and initiates a lifting motion of the handling device at the determined lifting time.

55. (New) A method according to claim 54, wherein at least one position detection device is provided which sends a trigger signal to the control device at the triggering time, when the relative position of the tools reaches the reference position, and wherein the control device determines the lifting time as a function of the input time of the trigger signal.

56. (New) A method according to claim 55, wherein the position detection device comprises a position switch which is associated with or located at a reference position, such that the position detection device changes its switching state when actuated by one of the two tools, and wherein a change in a switching state of the position switch is used as a trigger signal or triggering time.

57. (New) A method according to claim 54, further comprising at least one position detection device configured to:

(i) measure the relative position of the two tools with respect to one another continuously and/or at specified measuring points; and

(ii) send one of a corresponding position measurement signal and a corresponding position measurement value to the control device, wherein the control device is configured to:

(a) compare the one of the position measurement signal and the position measurement value to one of a reference signal or reference value corresponding to the reference position;

(b) use the agreement of the position measurement signal with the reference signal, or the position measurement value with the reference value, as a triggering time; and

(c) determine the lifting time based on the triggering time.

58. (New) A method according to claim 54, wherein the relative speed and/or relative acceleration of the two tools is determined by the reference position of the two tools, and the lifting time is determined from the triggering time as a function of at least one of the determined relative speed and the relative acceleration of the two tools.

59. (New) A method according to claim 54, wherein the lifting time is determined from the triggering time by counting or allowing a predetermined delay time to elapse with respect to the triggering time.

60. (New) A method according to claim 54, wherein at a starting time the control device sends a start signal to at least one handling device, such that after receiving the start signal the at least one handling device begins a lifting motion and lifts the workpiece at the lifting time.

61. (New) A method according to claim 60, wherein the control device determines the starting time for the start signal by one of, allowing time to elapse and counting a predetermined delay time, with respect to the triggering time, such that the lifting time occurs relative to the starting time in a well-defined manner.

62. (New) A method according to claim 61, wherein the lifting time is determined relative to the starting time by adding the signal propagation time and signal processing time of the start signal for the handling device.

63. (New) A method according to claim 59, wherein the delay time is predetermined as a function of the progression of at least one relative motion variable in the relative motion of the tools with respect to one another, and/or as a function of an adjusted or adjustable shaping energy.

64. (New) A method for shaping at least one workpiece, comprising:

placing a workpiece in a shaping position on a first of at least two tools of a shaping machine;

moving the tools of the shaping machine toward one another;

shaping the workpiece between the tools; and

subsequently moving the two tools away from one another;

wherein a triggering time is detected when the relative position of the tools has reached a predetermined reference position, such as during the relative motion of the tools toward one another;

beginning to lift the workpiece from the first tool at a lifting time utilizing at least one handling device,

determining the lifting time as a function of the triggering time, and

wherein the reference position for the tools is determined by the progression over time of the relative motion of both tools.

65. (New) A method according to claim 64, wherein the reference position for the tools is determined by one of the shaping energy for shaping the tool and a variable correlated with the shaping energy.

66. (New) A method according to claim 64, wherein the shaping energy for shaping the workpiece or a variable correlated with the shaping energy is adjustable to one of at least two

different values, and the reference position for the tools is set as a function of one of the adjusted value of the shaping energy and the variable correlated with the shaping energy.

67. (New) A method according to claim 66, wherein the reference position for the tools is determined so that one or both of the sum of the minimum signal or data propagation times and the signal or data processing times necessary for determining the lifting time from the triggering time is less than the time interval between the lifting time and the triggering time.

68. (New) A method according to claim 66, wherein the reference position corresponds to the relative position of the tools at their distance farthest apart from one another.

69. (New) A method according to claim 68, wherein the reference position is between the relative position of the tools at their distance farthest apart from one another and the closest relative position of the tools.

70. (New) A method according to claim 64, wherein the workpiece is handled at least during lifting by at least two handling devices, the motions and positions of the handling devices being automatically controlled or regulated by mutual coordination.

71. (New) A method according to claim 70, wherein the lifting time is learned or adaptively determined by determining the relative position of the tools at the lifting time and adjusting the lifting time to a desired value.

72. (New) A method according to claim 71, wherein the lifting time is adaptively determined by one or both of adapting the delay time to the triggering time and adjusting the reference position.

73. (New) A method according to claim 64, wherein scale material is blown from under one or both of the lifted tool and the first tool utilizing at least one blower.

74. (New) A method according to claim 72, wherein a switch-on time for the blower is determined as a function of the triggering time.

75. (New) A method according to claim 74, wherein the switch-on time occurs after the lifting time.

76. (New) A method according to claim 73, wherein a forging hammer, screw press, or crank press is provided as the shaping machine.

77. (New) A device for shaping at least one workpiece, comprising:

a) at least one shaping machine having at least two tools that are movable toward and away from one another for shaping a workpiece which is placed on a first of the tools in a predetermined shaping position between the tools,

b) at least one position detection device for detecting a triggering time when the relative motion of the tools is in or has reached a predetermined reference position, such as during the relative motion of the tools toward one another,

c) at least one handling device for handling the workpiece,

d) at least one control device for controlling or regulating the motions and positions of the handling device(s), and

e) the control device determining a lifting time as a function of the triggering time and actuating at least one handling device in such a way that at least one handling device begins to lift the workpiece from the first of the tools at the lifting time.

78. (New) A device according to claim 77, wherein each handling device comprises:

a) at least one gripping mechanism having at least two gripping elements that are movable relative to one another for gripping the workpiece,

b) at least one support apparatus to which the gripping mechanism can be fastened, and

c) at least one conveying device for conveying the support apparatus along with the gripping mechanism.

79. (New) A device according to claim 77, wherein the support apparatus and the conveying device in a flexible state are connected to one another in a flexible manner, and wherein the support apparatus and the conveying device in a rigid state are effectively one or both of connected to one another in a rigid manner and positioned relative to one another in a rigid manner, in at least one or both of one three-dimensional direction and each rotational position of one or both of the gripping mechanism and the gripping element(s).

80. (New) A device according to claim 78, wherein the support apparatus and the conveying device are connected to one another by at least one connecting element, and wherein the connecting device in the flexible state is flexible and in the rigid state is rigid.

81. (New) A device according to claim 78, wherein the support apparatus and the conveying device are connected to one another by at least one flexible element, such that when the support apparatus and the conveying device are in the flexible state, the support apparatus and the conveying device are connected only via the flexible element, and in the rigid state the support apparatus and the conveying device are effectively supported relative to one another by at least one support device which bridges the flexible element.

82. (New) A device according to claim 76, wherein the tools of the shaping machine comprise shaping forging die tools for combined shaping of the workpiece.

83. (New) A device according to claim 76, wherein the shaping machine comprises one or more of a forging hammer, screw press, or crank press.

84. (New) A device according to claim 76, having at least one blower for blowing scale material from under one or both of the lifted tool and the first tool.

85. (New) A device according to claim 83, wherein each blower is switched on by the control device at a switch-on time, and the control device determines the switch-on time as a function of the triggering time

86. (New) A device according to claim 85, wherein switch-on time occurs after the lifting time.